Denver Water

Operations & Maintenance Division
Standard Operating Procedure
Subject : Bacteriological Analysis
Item : Total Coliform Sample Collection
Date : September 1, 1999
Revision Date:

Purpose

A. Total Coliform bacteria analysis is performed to confirm an effective chlorination process. The absence of Total Coliform bacteria indicates the water is safe for consumption and free of harmful bacteria (disease causing bacteria).

Policy

A. To be developed.

Equipment

A. A 2-inch copper stand pipe with shut-off-valve, and an attached ¾-inch (90 degree bend) sample tap with a shut-off-valve. The standpipe shall be raised 24-inches above ground level at a 90-degree bend connected to the rehabilitated main at the 1 ½-inch corp valve (**Figure 1**).

B. A ¾-inch tap with a pressure gauge located on the vertical portion of the standpipe. This gauge will be used for determining the required velocities while flushing the rehabilitated main(s) (**Figure 1**).

C. A ¾-inch (90-degree angle) sample tap with a shut-off-valve tapped on the end of the invasion by-pass pipe (**Figure 2)**.

D. A ¾-inch tap with a pressure gauge located on the 2-inch □T□ at the fire hydrant for determining the required velocities while flushing the invasion pipe (**Figure 2**).

E. The following *shall not* be used for sample collection: *Fire hoses, rubber garden hoses, and/or fire hydrants.*

Procedure

A. After *dechlorination* and *before sampling*, the main shall be flushed through the blow-off for ½ hour at a low velocity **(<*70 PSIG*).**

B. Bacteriological Sample Collection:

1. An 18-hour incubation period is required for bacteriolog-

ical analysis (*Total Coliform Bacteria*).

2. *Monday-Thursday*: All bacteriological samples must be returned to the lab before 1500 hrs. If the sample is not returned to the lab before 1500 hours, the sample will be analyzed the following day. The results will be available 24 hours after the analysis has started.
3. *Friday*: All bacteriological samples must be returned to the lab before 1400 hours. The results will be e-mailed on the following Monday. If the sample is *not* returned to the lab before 1400 hours, the sample will be rejected. The sample collection will be rescheduled for the following Monday.
4. *Weekend(s)*: The Water Quality Laboratory is closed on Saturday and Sunday. If a dechlorination is scheduled during the weekend, the sample collection must be scheduled the following Monday.
5. *Holiday(s*): The Water Quality Laboratory is closed during Scheduled holidays. Sample collection can be scheduled after the holiday only if the holiday is on Monday, Tuesday, Wednesday or Thursday.
6. The results will be e-mailed to Denver Water's Construction Inspector(s). The DW inspector will relay the results to the Contractor.

C. If the sample *passes* (Total Coliform Bacteria Absent, the bypass or main may be placed into service.

D. If the sample *passes* (Total Coliform Bacteria Present), the bypass or main must be re-sampled as follows:
   1. Flush blow off for *4 hours* at a low velocity (<*70 PSIG*).
   2. Collect a *re-check* sample.
   3. Collect an *upstream* comparison sample if requested by the inspector.

E. In the event the re-check sample fails, schedule a chlorination, dechlorination, and sample collection with the Construction Inspector.

III. See attached **Figure 1** for details (*Main Sample Collection*).

IV. See attached **Figure 2** for details (*Invasion Pipe Sample Collection*).

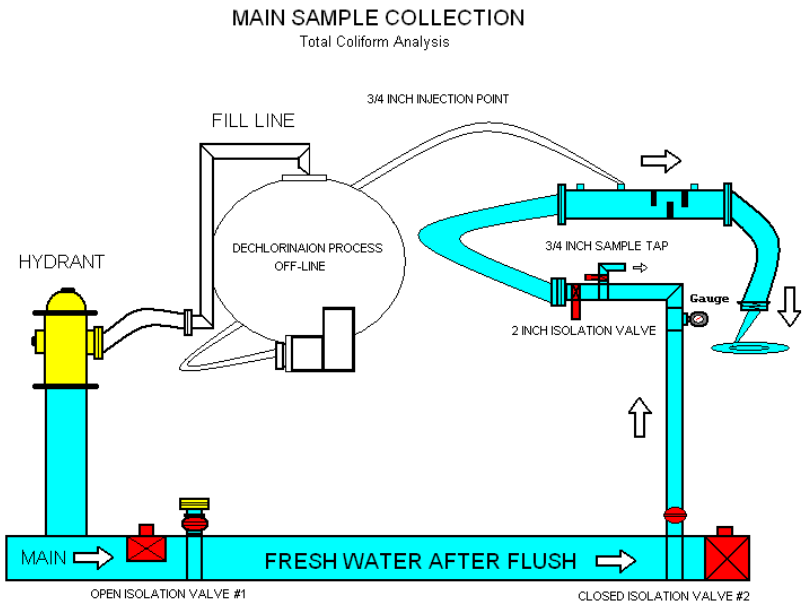

Figure 1

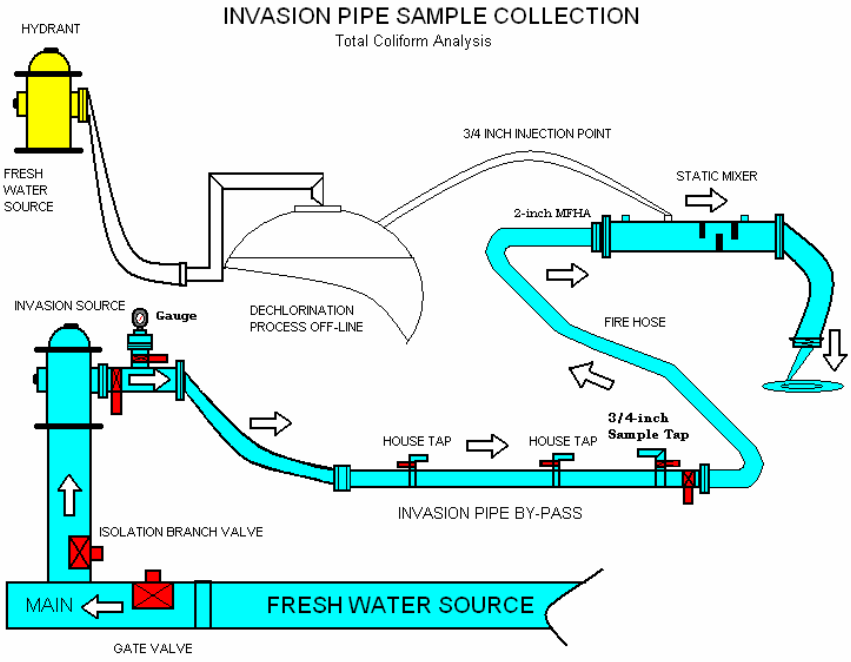

Figure 2